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10/675,169	09/30/2003	Ramesh Varadaraj	RV-0318	5906

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EXAMINER

COSTALES, SHRUTI S

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 09/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/675,169

Applicant(s)

VARADARAJ ET AL.

Examiner

Shruti S. Costales

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/4/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement submitted on August 4, 2004 was filed in compliance with the provisions of 37 CFR § 1.97. Accordingly, the information disclosure statement filed by the applicant has been considered by the Examiner.

Drawings

2. (a) The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character is not mentioned in the description: 4 shown in FIG. 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

(b) Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid

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abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

In addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy must be clearly labeled as "Annotated Sheets" and must be presented in the amendment or remarks section that explains the change(s) to the drawings. See 37 CFR 1.121(d)(1). Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

Specification

3. The abstract of the disclosure is objected to because the applicant makes improper use of legal phraseology, such as "comprising". See MPEP § 608.01(b).

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The disclosure is objected to because of the following minor informalities:

(i) In FIG. 1 "Fuel" is represented by reference numeral 1, wherein the specification describes the "fuel tank" as being represented by reference numeral 1.

Please refer to page 3, lines 8-9 of the specification.

(ii) In FIG. 1 "Air" is represented by reference numeral 4, wherein reference numeral 4 with respect to FIG. 1 is not mentioned in the specification.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 8-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More particularly, claim 8 recites a "mixing energy" that is expressed in "KW/liter of fluid", wherein it is not clear to one of ordinary skill in the art how kilowatts that is a unit of power is being used to express energy. Claims 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being dependent from a rejected base claim. It is noted that for the purposes of examination, the Examiner has converted applicant's kilowatts into energy by using the mixing time claimed in claim 10.

Appropriate clarification or correction is required.

7. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More particularly, claim 4 recites "substantially free of" salts, wherein it is not clear to one of ordinary skill in the art what criteria must be satisfied in order for the water to be "substantially free of" salts. Further, claim 4 recites "long from of The Period Table of Elements", wherein it is not clear to one of ordinary skill in the art what is meant by "long from" of the Periodic Table.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-4 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berlowitz (U.S. Pre-Grant Publication Number 2001/0038934) in view of WO 98/18884 (cited on PTO-1449 submitted on August 4, 2004).

Berlowitz discloses a fuel cell system and a method to operate a fuel cell (Page 1, paragraph [0003]). It is also disclosed that the fuel cell system includes a source of a fuel and water emulsion, a reformer for receiving the emulsion and producing hydrogen, a hydrogen-oxygen fuel cell connected to the reformer and able to receive hydrogen from the reformer (Page 1, paragraph [0004]). The method of operating a fuel cell system including a hydrogen-oxygen fuel cell includes producing the hydrogen from a fuel in water emulsion (Page 1, paragraph [0004]). It is further disclosed, with respect to FIG. 2, that a fuel/water emulsion is stored in a fuel tank and fuel is fed as needed through a preheater prior to entering the reformer (Page 2, paragraphs [0013]-[0014]). The hydrocarbon fuel includes low-sulfur gasoline, naphtha, etc. (Page 2, paragraph [0015]). It is to be noted that as the hydrocarbon fuels disclosed by Berlowitz correspond to the hydrocarbon fuels disclosed in the specification of the present application, the boiling ranges of such hydrocarbons would intrinsically fall within the claimed range. The emulsion includes other agents such as water miscible or water immiscible alcohols to depress the freeze point, surfactants, and/or anticorrosive agents (Page 2, paragraph [0016]). The ratio of number of moles of water compared to the number of moles of carbon contained in the hydrocarbon fuel is about 0.5 to about 3.0 (Page 2, paragraph [0017]). The surfactant concentration is less than 5 wt% of the total emulsion weight (Page 2, paragraph [0017]).

The difference between Berlowitz and the presently claimed invention is (a) the specific amounts of the hydrocarbon and water, and (b) the two types of claimed surfactants.

With respect to the difference in (a), '884, which is drawn to multi-phase water-in-oil emulsions useful as a fuel (Page 1, lines 4-5), discloses that water is present in an amount of at least 30 wt% (Page 7, lines 25-32). The water in '884 is at a purity level of at least about 99.5% (Page 9, lines 14-16) therein intrinsically implying that the water is substantially free from salts of halides, sulfates and carbonates. Example 1 of '884 continuing from page 18 onto page 19, lines 1-14 discloses that water is present in an amount of 40.65 wt%, diesel fuel is present in an amount of 40.65 wt%, and 1-butanol and 1-hexanol are present in an amount of 4.05 wt%. It would have been obvious to one of ordinary skill in the art to prepare Berlowitz's emulsion by combining the '884's disclosed amounts of emulsion components because a clear, stable, fuel-water nanoemulsion results (Page 18, line 23).

With respect to the difference in (b), '884 discloses surfactants including polyoxyethylene sorbitan monooleate, polyoxyethylene sorbitan monolaurate, and those surfactants that are disclosed in U.S. Patent Nos. 4,083,698 and 4,821,757 (Page 9, lines 17-32; Page 10, lines 1-17; see also pages 10-16). Further, according to Example 1 of '884 on page 19, lines 1-4, polyethoxylated octanol and polyglycerol-4-monooleate are disclosed. It is further disclosed that the surfactant is present in an amount of not more than 5 wt% based on the total weight of the emulsion composition (Page 15, lines 1-10). It is to be noted that '884 does not disclose the thermal decomposition range for

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its surfactants, however, such a property would be intrinsic to the surfactants that correspond to the ones presently claimed. It would have been obvious to one of ordinary skill in the art to use '884's surfactants in Berlowitz's emulsion in the amount specified by Berlowitz because when these surfactants are combined with said emulsion they will facilitate assembly of separate aqueous and nonaqueous phases (Page 9, lines 17-19 and Page 11, lines 5-26), thereby obtaining the invention as set forth in the presently cited claims.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berlowitz in view of WO 98/18884 as applied to claims 1-4 and 6-7 above, and further in view of Krivohlavek (U.S. Patent Number 5,505,877).

The discussion above regarding Berlowitz and WO 98/18884 in paragraph 9 is herein incorporated by reference.

The difference between Berlowitz in view of WO 98/18884 and the presently cited claims is a complex oil-in-water-in-oil emulsion.

Krivohlavek, which is drawn to the creation and use of multiple phase emulsions or gels to produce a product suitable for burner fuel and combustion (Col. 1, lines 15-17), discloses oil-in-water-in-oil phases (Col. 2, lines 29-57). It would have been obvious to one of ordinary skill in the art to use the oil-in-water-in-oil phases as disclosed by Krivohlavek in Berlowitz's emulsion because such a multiple-phase emulsion would have expanded physical properties enhancing combustion (Col. 2, lines 33-42), thereby obtaining the invention as set forth in the presently cited claims.

11. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berlowitz in view of WO 98/18884, Krivohlavek, and Yeagar et al. (U.S. Pre-Grant Publication Number 2002/0177027).

Berlowitz discloses a fuel cell system and a method to operate a fuel cell (Page 1, paragraph [0003]). It is also disclosed that the fuel cell system includes a source of a fuel and water emulsion, a reformer for receiving the emulsion and producing hydrogen, a hydrogen-oxygen fuel cell connected to the reformer and able to receive hydrogen from the reformer (Page 1, paragraph [0004]). The method of operating a fuel cell system including a hydrogen-oxygen fuel cell includes producing the hydrogen from a fuel in water emulsion (Page 1, paragraph [0004]). It is further disclosed, with respect to FIG. 2, that a fuel/water emulsion is stored in a fuel tank and fuel is fed as needed through a preheater prior to entering the reformer (Page 2, paragraphs [0013]-[0014]). The hydrocarbon fuel includes low-sulfur gasoline, naphtha, etc. (Page 2, paragraph [0015]). It is to be noted that as the hydrocarbon fuels disclosed by Berlowitz correspond to the hydrocarbon fuels disclosed in the specification of the present application, the boiling ranges of such hydrocarbons would intrinsically fall within the claimed range. The emulsion includes other agents such as water miscible or water immiscible alcohols to depress the freeze point, surfactants, and/or anticorrosive agents (Page 2, paragraph [0016]). The ratio of number of moles of water compared to the number of moles of carbon contained in the hydrocarbon fuel is about 0.5 to about 3.0 (Page 2, paragraph [0017]). The surfactant concentration is less than 5 wt% of the total emulsion weight (Page 2, paragraph [0017]).

The difference between Berlowitz and the presently claimed invention is (a) the specific amounts of the hydrocarbon and water, (b) the two types of claimed surfactants, (c) a complex oil-in-water-in-oil emulsion, and (d) mixing at a specified mixing energy.

With respect to the difference in (a), '884, which is drawn to multi-phase water-in-oil emulsions useful as a fuel (Page 1, lines 4-5), discloses that water is present in an amount of at least 30 wt% (Page 7, lines 25-32). The water in '884 is at a purity level of at least about 99.5% (Page 9, lines 14-16) therein intrinsically implying that the water is substantially free from salts of halides, sulfates and carbonates. Example 1 of '884 continuing from page 18 onto page 19, lines 1-14 discloses that water is present in an amount of 40.65 wt%, diesel fuel is present in an amount of 40.65 wt%, and 1-butanol and 1-hexanol are present in an amount of 4.05 wt%. It would have been obvious to one of ordinary skill in the art to prepare Berlowitz's emulsion by combining the '884's disclosed amounts of emulsion components because a clear, stable, fuel-water nanoemulsion results (Page 18, line 23).

With respect to the difference in (b), '884 discloses surfactants including polyoxyethylene sorbitan monooleate, polyoxyethylene sorbitan monolaurate, and those surfactants that are disclosed in U.S. Patent Nos. 4,083,698 and 4,821,757 (Page 9, lines 17-32; Page 10, lines 1-17; see also pages 10-16). Further, according to Example 1 of '884 on page 19, lines 1-4, polyethoxylated octanol and polyglycerol-4-monooleate are disclosed. It is further disclosed that the surfactant is present in an amount of not more than 5 wt% based on the total weight of the emulsion composition (Page 15, lines 1-10). It is to be noted that '884 does not disclose the thermal decomposition range for

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its surfactants, however, such a property would be intrinsic to the surfactants that correspond to the ones presently claimed. It would have been obvious to one of ordinary skill in the art to use '884's surfactants in Berlowitz's emulsion in the amount specified by Berlowitz because when these surfactants are combined with said emulsion they will facilitate assembly of separate aqueous and nonaqueous phases (Page 9, lines 17-19 and Page 11, lines 5-26), thereby obtaining the invention as set forth in the presently cited claims.

With respect to the difference in (c), Krivohlavek, which is drawn to the creation and use of multiple phase emulsions or gels to produce a product suitable for burner fuel and combustion (Col. 1, lines 15-17), discloses oil-in-water-in-oil phases (Col. 2, lines 29-57). It would have been obvious to one of ordinary skill in the art to use the oil-in-water-in-oil phases as disclosed by Krivohlavek in Berlowitz's emulsion because such a multiple-phase emulsion would have expanded physical properties enhancing combustion (Col. 2, lines 33-42).

With respect to the difference in (d), Yeagar, which is drawn to compositions useful in fuel cells (Page 1, paragraph [0005]), discloses mixing energies of less than about 50 KJ/liter (Page 13, paragraph [0104]), which when converted into units of power using the amount of mixing time recited in claim 10 of the present application falls within the presently recited range. It would have been obvious to one of ordinary skill in the art to combine the mixing energies disclosed by Yeagar to mix Berlowitz's emulsion because properties such as electrical conductivity can be maintained (Page 13,

paragraph [0104]) while ensuring thorough mixing of the emulsion, thereby obtaining the invention as set forth in the presently cited claims.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berlowitz in view of WO 98/18884, Krivohlavek, and Yeagar as applied to claims 8 and 10 above, and further in view of Binet et al. (U.S. Patent Number 4,461,660).

The difference between Berlowitz in view of WO 98/18884, Krivohlavek, and Yeagar and the presently cited claims is that the mixing is conducted by an in-line mixer, static paddle mixer, sonicator, or combination thereof.

Binet, which is drawn to water-in-oil emulsions (Col. 1, lines 5-7), discloses in-line mixers (Col. 2, lines 17-25) and paddle mixers (Col. 5, lines 36-45). It would have been obvious to one of ordinary skill in the art to use Binet's mixers to mix Berlowitz's emulsion because an emulsion having fine droplets will result (Col. 2, lines 17-25) providing intrinsic homogeneity to such an emulsion, thereby obtaining the invention as set forth in the presently cited claim.

13. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berlowitz in view of WO 98/18884 and Krivohlavek.

Berlowitz discloses a fuel cell system and a method to operate a fuel cell (Page 1, paragraph [0003]). It is also disclosed that the fuel cell system includes a source of a fuel and water emulsion, a reformer for receiving the emulsion and producing hydrogen, a hydrogen-oxygen fuel cell connected to the reformer and able to receive hydrogen

from the reformer (Page 1, paragraph [0004]). The method of operating a fuel cell system including a hydrogen-oxygen fuel cell includes producing the hydrogen from a fuel in water emulsion (Page 1, paragraph [0004]). It is further disclosed, with respect to FIG. 2, that a fuel/water emulsion is stored in a fuel tank and fuel is fed as needed through a preheater prior to entering the reformer (Page 2, paragraphs [0013]-[0014]). The hydrocarbon fuel includes low-sulfur gasoline, naphtha, etc. (Page 2, paragraph [0015]). It is to be noted that as the hydrocarbon fuels disclosed by Berlowitz correspond to the hydrocarbon fuels disclosed in the specification of the present application, the boiling ranges of such hydrocarbons would intrinsically fall within the claimed range. The emulsion includes other agents such as water miscible or water immiscible alcohols to depress the freeze point, surfactants, and/or anticorrosive agents (Page 2, paragraph [0016]). The ratio of number of moles of water compared to the number of moles of carbon contained in the hydrocarbon fuel is about 0.5 to about 3.0 (Page 2, paragraph [0017]). The surfactant concentration is less than 5 wt% of the total emulsion weight (Page 2, paragraph [0017]). It is to be noted that with respect to claim 14, as the emulsion obtained from Berlowitz in view of WO 98/18884 corresponds to the claimed emulsion, the conductivity of the emulsion would intrinsically be the same as the claimed conductivity.

The difference between Berlowitz and the presently claimed invention is (a) the specific amounts of the hydrocarbon and water, (b) the two types of claimed surfactants, and (c) a complex oil-in-water-in-oil emulsion.

With respect to the difference in (a), '884, which is drawn to multi-phase water-in-oil emulsions useful as a fuel (Page 1, lines 4-5), discloses that water is present in an amount of at least 30 wt% (Page 7, lines 25-32). The water in '884 is at a purity level of at least about 99.5% (Page 9, lines 14-16) therein intrinsically implying that the water is substantially free from salts of halides, sulfates and carbonates. Example 1 of '884 continuing from page 18 onto page 19, lines 1-14 discloses that water is present in an amount of 40.65 wt%, diesel fuel is present in an amount of 40.65 wt%, and 1-butanol and 1-hexanol are present in an amount of 4.05 wt%. It would have been obvious to one of ordinary skill in the art to prepare Berlowitz's emulsion by combining the '884's disclosed amounts of emulsion components because a clear, stable, fuel-water nanoemulsion results (Page 18, line 23).

With respect to the difference in (b), '884 discloses surfactants including polyoxyethylene sorbitan monooleate, polyoxyethylene sorbitan monolaurate, and those surfactants that are disclosed in U.S. Patent Nos. 4,083,698 and 4,821,757 (Page 9, lines 17-32; Page 10, lines 1-17; see also pages 10-16). Further, according to Example 1 of '884 on page 19, lines 1-4, polyethoxylated octanol and polyglycerol-4-monooleate are disclosed. It is further disclosed that the surfactant is present in an amount of not more than 5 wt% based on the total weight of the emulsion composition (Page 15, lines 1-10). It is to be noted that '884 does not disclose the thermal decomposition range for its surfactants, however, such a property would be intrinsic to the surfactants that correspond to the ones presently claimed. It would have been obvious to one of ordinary skill in the art to use '884's surfactants in Berlowitz's emulsion in the amount

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specified by Berlowitz because when these surfactants are combined with said emulsion they will facilitate assembly of separate aqueous and nonaqueous phases (Page 9, lines 17-19 and Page 11, lines 5-26), thereby obtaining the invention as set forth in the presently cited claims.

With respect to the difference in (c), Krivohlavek, which is drawn to the creation and use of multiple phase emulsions or gels to produce a product suitable for burner fuel and combustion (Col. 1, lines 15-17), discloses oil-in-water-in-oil phases (Col. 2, lines 29-57). It would have been obvious to one of ordinary skill in the art to use the oil-in-water-in-oil phases as disclosed by Krivohlavek in Berlowitz's emulsion because such a multiple-phase emulsion would have expanded physical properties enhancing combustion (Col. 2, lines 33-42), thereby obtaining the invention as set forth in the presently cited claims.

14. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berlowitz in view of WO 98/18884 and Krivohlavek as applied to claims 11-14 above, and further in view of Yu et al. (U.S. Patent Number 5,444,078).

The difference between Berlowitz in view of WO 98/18884 and Krivohlavek and the presently cited claims is that the emulsion is stable to freeze thaw cycles in the temperature range of -54°C to $+50^{\circ}\text{C}$.

Yu, which is drawn to microemulsions useful in fuels (Col. 2, lines 48-66), discloses that the microemulsions are evaluated in freeze-thaw cycles (Col. 10, lines 48-59), wherein the high temperature is 55°C and the low temperature is between 0°C

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to 2° C (Col. 11, lines 28-44). It would have been obvious to one of ordinary skill in the art to use the temperature ranges specified by Yu to determine freeze-thaw stability of Berlowitz's emulsions because it is possible to determine the stability of such emulsions (Col. 12, lines 16-17), thereby obtaining the invention as set forth in the presently cited claim.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shruti S. Costales whose telephone number is (571) 272-8389. The examiner can normally be reached on Monday - Friday, 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

SSC
Shruti S. Costales
September 1, 2005

Callie Shosho
CALLIE E. SHOSHO
PRIMARY EXAMINER